

ABSTRACT OF THE DISCLOSURE

[00261] A system and method is provided that employs a frequency domain interpolative CODEC system for low bit rate coding of speech which comprises a linear prediction (LP) front end adapted to process an input signal that provides LP parameters which are quantized and encoded over predetermined intervals and used to compute a LP residual signal. An open loop pitch estimator adapted to process the LP residual signal, a pitch quantizer, and a pitch interpolator and provide a pitch contour within the predetermined intervals is also provided. Also provided is a signal processor responsive to the LP residual signal and the pitch contour and adapted to perform the following: provide a voicing measure, where the voicing measure characterizes a degree of voicing of the input speech signal and is derived from several input parameters that are correlated to degrees of periodicity of the signal over the predetermined intervals; extract a prototype waveform (PW) from the LP residual and the open loop pitch contour for a number of equal sub-intervals within the predetermined intervals; normalize the PW by a gain value of the PW; encode a magnitude of the PW; and separate stationary and nonstationary components of the PW using a low complexity alignment process and a filtering process that introduce no delay. The ratio of the energy of the nonstationary component of the PW to that of the stationary component of the PW is averaged across 5 subbands to compute the nonstationarity measure as a frequency dependent vector entity. A measure of the degree of voicing of the residual is also computed using openloop pitchgain, pitch variance, relative signal power, PW correlation and PW nonstationarity in low frequency subbands. The nonstationarity measure and voicing measure are encoded using a 6-bit spectrally weighted vector quantization scheme using a codebook partitioned based on a voiced/unvoiced decision. At the decoder, a stationary component of PW is reconstructed as a weighted combination of the previous PW phase vector, a random phase perturbation and a fixed phase vector obtained from a voiced pitch pulse.